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EXAMINER	
NORRIS, JEREMY C	

ART UNIT	PAPER NUMBER
2841	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/042,031	BUDELL ET AL.	
	Examiner	Art Unit	
	Jeremy C. Norris	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3,5,6,13,15,16 and 20* is/are allowed.

6)☒ Claim(s) *1,2,4,7-12,14,17-19,23,25,26 and 28* is/are rejected.

7)☒ Claim(s) *21,22,24 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 23 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,519,176 (Goodman).

Goodman discloses, referring to figures 4A-C, a method for forming an electrical structure, comprising the steps of, providing a dielectric layer (10 and overlying insulating layer described in col. 5, lines 50-65) having a metal signal line (12) therein, laminating a first metal voltage plane (14C) to a first surface of the dielectric substrate, and forming an opening (best seen in fig. 4C) in the first metal voltage plane such that a first electrically conductive strip (14) across the opening includes an image of a first portion of the metal signal line, wherein the image of the first portion of the metal signal line projects across the opening in the first metal voltage plane, and wherein the step of laminating the first metal voltage plane to the first surface of the dielectric substrate is performed before the step of forming the opening in the first metal plane (first copper is cladded to a glass epoxy laminate then the copper is patterned into conductors 14 and 14C, see col. 7, line 60 – col. 8, line 10) [**claim 23**].

Alternately, Goodman discloses, referring to figures 4A-C, a method for forming an electrical structure, comprising the steps of, providing a dielectric layer (10 and

overlying insulating layer described in col. 5, lines 50-65) having a metal signal line (12) therein, laminating a first metal voltage plane (14C) to a first surface of the dielectric substrate, and forming an opening (best seen in fig. 4C) in the first metal voltage plane such that a first electrically conductive strip (14) across the opening includes an image of a first portion of the metal signal line, wherein the image of the first portion of the metal signal line projects across the opening in the first metal voltage plane, and wherein the step of laminating the first metal voltage plane to the first surface of the dielectric substrate is performed after the step of forming the opening in the first metal plane (conductors 14 and 14C are first screen printed on the substrate in the desired pattern, including the openings, and are then co-fired to obtain the final laminated product, see col. 6, line 25 – col. 7, line 20) [**claim 26**]

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 4, 7-12, 14, 17-19 25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,519,176 (Goodman) in view of US 6,433,286 (Doberenz).

Goodman discloses, referring to figures 4A-C, an electrical structure, comprising: a dielectric substrate (10) having a metal signal line (12) therein (the portion of the substrate above signal line 12 not shown but referred to in col. 5, lines 50-65); and a first metal voltage plane (14C) laminated to a first surface of the dielectric substrate, wherein the first metal voltage plane includes an opening (space between lines 14C), wherein an image of a first portion of the metal signal line projects across the opening in the first metal voltage plane, and wherein a first electrically conductive strip (14) across the opening in the first metal voltage plane includes the image of the first portion. Goodman does not specifically state that the opening in the first metal voltage plane has an outer boundary whose shape is circular or elliptical [**claims 1, 11**]. Instead, Goodman teaches arbitrary opening (see figure 4C). However, it is well known in the

art to form circular opening in voltage planes underlying signal lines as evidenced by Doberenz (see figure 4). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to form circular openings in the voltage plane of Goodman as is well known in the art and evidenced by Doberenz. The motivation for doing so would have been to match the impedance of the signal pattern. Additionally, the modified invention of Goodman teaches wherein the first electrically conductive strip is integral with the first metal voltage plane (see fig. 4C) **[claims 2, 12]**, wherein the first electrically conductive strip is linear across the opening in the first metal voltage plane **[claims 4, 14]**, wherein a signal current is flowing through the metal signal line, wherein a return current is flowing through the first electrically conductive strip, wherein the signal current is an alternating current, and wherein the return current includes a portion of the signal current **[claims 7, 17]**, wherein the electrical structure comprises an electrical apparatus selected from the group consisting of a chip carrier and a printed circuit board, and wherein the electrical apparatus includes the dielectric substrate and the metal voltage plane **[claim 8]**, further comprising: a second metal voltage plane (G1) laminated to a second surface of the dielectric substrate, 3 wherein the second metal voltage plane includes an opening, wherein an image of a second portion of the metal signal line projects across the opening in the second metal voltage plane, and wherein a second electrically conductive strip across the opening in the second metal voltage plane includes the image of the second portion (not shown but described, see col. 9, lines 50-60) **[claim 9, 18]**, wherein a signal current is flowing through the metal signal line, wherein a first return current is flowing through the first electrically conductive strip,

wherein a second return current is flowing through the second electrically conductive strip, wherein the signal current is an alternating current, wherein the first return current includes a first portion of the signal current, and wherein the second return current includes a second portion of the signal current [**claims 10, 19**].

Similarly, regarding claim 25, Goodman discloses the claimed invention as described above with respect to claim 23, except Goodman does not specifically state that the opening in the first metal voltage plane has an outer boundary whose shape is circular or elliptical [**claim 25**]. Instead, Goodman teaches arbitrary opening (see figure 4C). However, it is well known in the art to form circular opening in voltage planes underlying signal lines as evidenced by Doberenz (see figure 4). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to form circular openings in the voltage plane of Goodman as is well known in the art and evidenced by Doberenz. The motivation for doing so would have been to match the impedance of the signal pattern.

Moreover, regarding claim 28, Goodman discloses the claimed invention as described above with respect to claim 23, except Goodman does not specifically state that the opening in the first metal voltage plane has an outer boundary whose shape is circular or elliptical [**claim 28**]. Instead, Goodman teaches arbitrary opening (see figure 4C). However, it is well known in the art to form circular opening in voltage planes underlying signal lines as evidenced by Doberenz (see figure 4). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to form circular openings in the voltage plane of Goodman as is well known in the art and

evidenced by Doberenz. The motivation for doing so would have been to match the impedance of the signal pattern.

Response to Arguments

Applicant's arguments with respect to claims 1, 2, 4, 7-12, 14, and 17-19 have been considered but are moot in view of the new ground(s) of rejection. Exmaniner notes that Applicants have provided no specific arguments for newly added claims 21-28

Allowable Subject Matter

Claims 3, 5, 6, 13, 15, 16 and 20 are allowed.

Claims 21, 22, 24, 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: **Claims 3 and 13** state the limitation "wherein the first electrically conductive strip is not integral with the first metal voltage plane". The word integral has been examined in light of its plan meaning, i.e. "formed as a unit with another part". Therefore, "not integral" is examined as distinct and separate parts. In light of this definition, this limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art. **Claims 5 and 15** state the limitation "wherein the first electrically conductive strip is nonlinear across the opening in the first metal voltage plane". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art. **Claims**

6 and 16 state the limitation "wherein the opening in the first metal voltage plane has a vent area of no less than about 0.1 square millimeters". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art. **Claim 20** states the limitation "determining at least one problematic opening of the opening, wherein the at least one problematic opening is above or below a corresponding metal signal lines within the dielectric laminate such that an image of a portion of the corresponding metal signal lines projects across the at least one problematic opening". Applicant has supplied the specific definition "A problematic opening is defined herein as an opening that is above or below a corresponding metal signal line within the dielectric laminate such that an image of a portion of the corresponding metal signal line projects across the problematic opening, such that the problematic opening results in unacceptably degraded electrical performance. In light of this definition, this limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art. **Claims 21, 22, 24, and 27** state the limitation "wherein the first metal voltage plane comprises a first metal, wherein the first electrically conductive strip comprises a second metal, and wherein the first metal differs from the second metal". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

KAMAND CUNEO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800